Return to Space

ARNOLD AIR FORCE BASE, Tenn. – The Arnold Engineering Development Center conducted tests in its Propulstion Wind Tunnel on a three percent scale model of the space shuttle, pictured above, helping NASA move one step closer to returning the space shuttle to flight. Space Shuttle Columbia and its seven-person crew were lost Feb. 1, 2003, during atmospheric re-entry. Space Shuttle Discovery, one of three shuttle spacecraft, is scheduled for return to flight no earlier than May 15. (Illustration by 1st Lt. Timothy Lundberg from an AEDC test photo.)

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LEADING EDGE

Headquarters
Air Force Materiel Command
Wright-Patterson Air Force Base, Ohio

Commander
Gen. Gregory S. Martin

Director of Public Affairs
Col. Jack Ivy

Internal Information Division Chief
Robert Ely

Executive Editor
Capt. Danielle Burrows

Design Editor
1st Lt. Tim Lundberg

Editorial Assistant
Michelle Gigante

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For writers' guidelines and information on submitting photographs or articles for publication, call the executive editor at 937-257-1203 (DSN 787-1203); or write to:
***The* Leading Edge**
HQ AFMC/PAI
4375 Chidlaw Road
Bldg 262 Rm N-152
WPAFB, OH 45433-5006
Email:
AFMC.pa.newsroom@wpafb.af.mil

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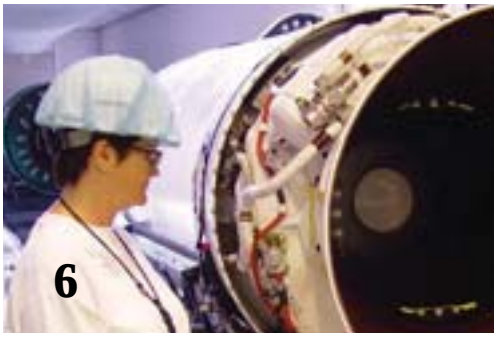
Features



Around the command

☆☆☆☆ Gen. Gregory S. Martin

Operating Quality Installations

One of our goals at Air Force Materiel Command is to operate quality installations. As part of that goal, I am currently focused on three areas:

- Base Realignment And Closure
- Installation Appearance Standards
- Attitude Of Spirit And Service

Base Realignment and Closure

Our Command, like others across the Air Force and DOD, has done quite a lot of work to help prepare DOD for this year's BRAC. AFMC will continue to answer all DOD-directed taskings and calls for information while rigorously complying with BRAC rules of engagement—and then be prepared to support the recommendations when they are announced by the Secretary of Defense in May 2005.

I see our BRAC responsibilities as twofold. First, we must ensure we look for every opportunity to make our Command as efficient as possible. And second, we must articulate our positions to Air Staff without sacrificing the core capabilities AFMC needs to ensure adequate Science and Technology development and integration, acquisition support, and sustainment of the systems our entire Air Force depends on. In both areas, those of you involved in this process have been most professional and I appreciate your efforts.

AFMC Handbook on Installation Appearance Standards

The way we treat our customers at base level relates to how we feel about our work environment and the pride we feel in our workplace and in our base overall. As a result, I plan to focus this year on installation appearance during my visits around the Command. We must pay attention to how our bases look in terms of architecture, roads and grounds, landscaping, entry points, parking lots, utilities, paint schemes, family housing, and other areas. It's important day-to-day, but it's also critical when building new mission or support facilities or performing major renovations. During our Strategic Planning Offsite, Brigadier General Larry Spencer, our headquarters AFMC Director of Mission Support, took the lead to create an AFMC handbook on installation appearance standards. The handbook will provide a standard against which we measure ourselves. In addition to installation appearance, we will also work with the Air Force to develop specific standards for ensuring our bases remain secure and protected.

Spirit of service and installation appearance excellence go hand in hand, and this year we will spend considerable time working to improve in both areas.

Attitude and Spirit of Service

During our recent Strategic Planning Offsite at Brooks City-Base in San Antonio, Texas, we talked a lot about one of the objectives within the "operate quality installations" AFMC goal. That objec-

Karisa Washington carefully studies Maj. Nancy O'Connell's face during the 10-month-old's exam in the pediatric clinic at Tinker AFB. Clinic workers provide health-care services for about 3,000 of the youngest members of military families. (AF photo by Margo Wright)

Peter McMullen and Sam Morgan clear a planter and bushes from the base of a tree at Eglin AFB. Surfacing roots are a warning sign of tree stress and suffocation. The men are both 796th Civil Engineer Squadron grounds supervisors. (AF photo by Doris Johnson)

"Positive attitude leads to a spirit of service that customers remember and that's the end goal we want to achieve across all our AFMC bases."

tive is foundational and reads: develop and sustain a culture of pride in providing world-class mission support. Our discussions centered on the importance of each service provider's attitude and how a positive attitude translates into a spirit of service that customers remember.

Our fifth Chief Master Sergeant of the Air Force, Bob Gaylor, an outstanding public speaker, gives a talk on the subject of Attitude Versus Aptitude.

His key message is that a person's attitude, not his or her aptitude, is a critical measure of future success … and a key to providing world-class customer service. We can improve aptitude quickly with training and education, but that's not necessarily the case with attitude which is internal and more influenced by individual action.

Chief Gaylor's thoughts were confirmed a few months ago when we had the opportunity to meet with Mr. Herb Kelleher, former Chief Executive Officer of Southwest Airlines. Mr. Kelleher started Southwest Airlines in 1969 and has led the company to achieve a profit every year since that time—unparalleled in the airline industry! Mr. Kelleher told us in no uncertain terms that his company hires based on attitude first. Their philosophy is that an employee's attitude is what most impacts treatment of customers, and that's what's paramount to Southwest Airlines. The company influences aptitude through extensive training, but it's attitude that gets a person hired in the first place.

Positive attitude leads to a spirit of service that customers remember, and that's the end goal we want to achieve across all our AFMC bases.

"Develop and sustain a culture of pride in providing world-class mission support"

IT'S MOVING TIME

ARNOLD AIR FORCE BASE, Tenn. – Moving a seven-ton rocket motor loaded with explosive fuel can be a tricky proposition, but that task just became easier, safer and more efficient at Arnold Engineering Development Center.

AEDC employees used a new transport system in January to move two such rocket motors — stage two and stage three motors for the Minuteman intercontinental ballistic missile — into place at the Rocket Preparation Area on a remote part of Arnold.

"It's a big day," said Aerospace Testing Alliance employee Dwight Crosslin as he prepared for the first operational use of the new transport system.

AEDC employee Cindy Yates uses a brake handle to maintain control of a Minuteman ICBM upper stage rocket motor. (AF photo)

Arnold helps spacecraft get home

ARNOLD AIR FORCE BASE, Tenn – The Arnold Engineering Development Center helped lay the groundwork for a historic mission to space Jan. 14.

On that mission, the joint European Space Agency and NASA sent a probe through the atmosphere of Saturn's largest moon, Titan, to collect surface data for study by scientists.

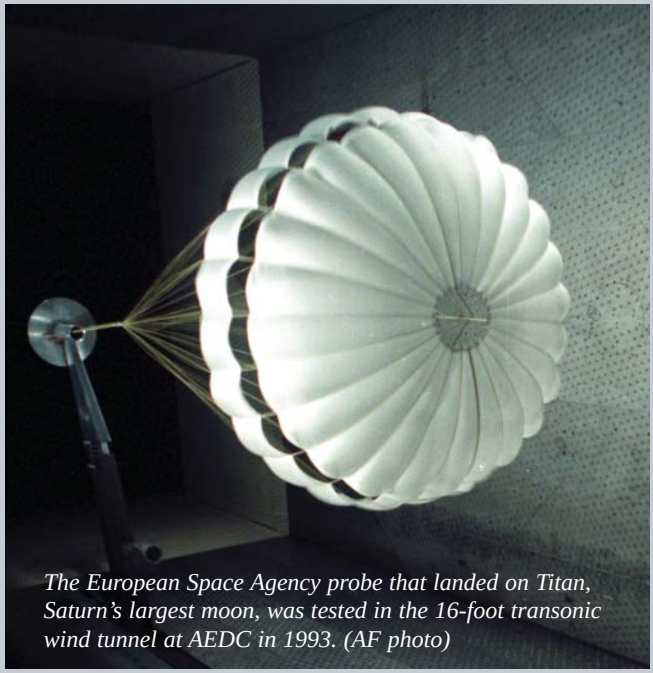
Long before the launch from earth toward Titan, AEDC test engineers conducted parachute deployment and drag tests on the probe in the center's 16-foot transonic wind tunnel ensuring the probe would safely descend to Titan.

The AEDC team also tested the rocket engine used to launch the probe into outer space in the center's Rocket Propulsion Test Cell J-4 where altitudes are simulated up to 100,000 feet.

Titan is a prime target of research for scientists because it is the only moon in the solar system with its own atmosphere and is larger than the planets Mercury and Pluto.

AEDC has a long history of supporting NASA and the European Space Agency dating back to the Apollo, Saturn and Mercury missions.

– AEDC Public Affairs



The European Space Agency probe that landed on Titan, Saturn's largest moon, was tested in the 16-foot transonic wind tunnel at AEDC in 1993. (AF photo)

Lab hopes to develop enhanced warning system for flyers

BROOKS CITY-BASE, Texas – The Air Force Research Laboratory has launched an innovative study here that supports the development of a new flight warning system designed to significantly enhance pilot safety.

Numerous incidents of general aviation pilots violating controlled airspace led to the AFRL study, which focuses on safely using laser light for a new aviation signaling system.

"It became obvious to air traffic controllers that a secondary warning system beyond radio communications is needed to let pilots know to change course," said Maj. (Dr.) Laura Barnes, principal investigator for the Optical Radiation Branch in AFRL's Human Effectiveness Directorate.

The potential for navigational confusion near critical infrastructures prompted the aviation community to seek development of an effective secondary signal warning system, said Major Barnes. This proposed system would be a better alternative to today's broadband light sources, which are not effective across long distances.

The study began with a preliminary investigation using experienced pilots. Ten pilots observed a series of laser light signals, varying in intensity, during simulated day and night flight scenarios.

– HSW Public Affairs

A truck and an enclosed, climate-controlled trailer had transported the two Minuteman motors to Arnold from the Minuteman System Program Office at Hill Air Force Base, Utah.

The truck backed up to preparation bays that house the new rail system. After inspecting the motors, lining up the rails and making other preparatory actions, workers rolled the first motor onto the rails and into the rocket preparation area.

Previously, motors were moved into AEDC's rocket preparation area using a heavy-duty crane.

The old lifting system required more manual labor and posed more risk to the motor, explained Lt. Col. Curt Amble, chief of the AEDC Space and Missile System Test Division. "Using the rails, we just pull the motor off the truck. It's much quicker and safer. The unloading operation takes about 20 minutes, compared to about 3 hours before," he said.

– AEDC Public Affairs

Center answers C-130 queries

ROBINS AIR FORCE BASE, Ga. – A new customer relations management call center will test new approaches to answering all C-130 customer queries.

The call center, part of the Warner-Robins Air Logistics Center Aircraft Sustainment Directorate, provides a team to take all C-130 calls and provide immediate responses.

The goal is to make the caller only one call away from his or her answer. Customers no longer have to identify which office to call depending on their C-130 question; all that's needed is one number.

This test of one-stop support to C-130 operators began in September, 2004, and will last through August.

The test will enable the logistics center to validate AFMC's newly designed processes for customer collaboration.

Additionally, it will direct support using the existing Air Force Portal, and future electronic visibility and ordering software tools. These processes were designed by AFMC's Purchasing and Supply Chain Management team.

The test focuses primarily on tactical problem solving, such as parts chasing, requisition status, technical issues and customer support. Additionally, by funneling all calls through a central area, the team is able to gather data and provide trend analysis to the supply chain managers, which highlights potential problems, either in repair, manufacturing or training.

If the test proves successful, as expected, AFMC would expand the customer relations management throughout the command.

– WR-ALC Aircraft Sustainment Directorate

F-15E certified for new weapon

An F-15 Eagle from the 33rd Fighter Wing, Eglin Air Force Base, Fla., receives fuel from a tanker assigned to the 401st Air Expeditionary Wing, operating from a forward-deployed location. (AF photo by Master Sgt. Mark Bucher)

EGLIN AIR FORCE BASE, Fla. – In a combined effort last month, the 500-pound Joint Direct Attack Munition, or GBU-38, was certified for use on the F-15E.

The Global Positioning System precision guided weapon was first cleared with the 46th Test Wing before undergoing operational testing with the 53rd Wing.

The weapon, which yields low collateral damage with accurate coordinate impact, was requested by the warfighters after its use on the F-16. This allows the F-15E to support ground troops with minimal damage to them or civilians.

"The GBU-38, as we're supporting it, is becoming the weapon of choice for limiting collateral damage," said Lt. Col. Keith Kosan, 40th Flight Test Squadron commander. "To support combat operations deploying to the desert soon, they wanted this capability, so we pushed it through."

Getting certification required the work of the 40th Flight Test Squadron, the 85th Test and Evaluation Squadron and the Combined Test Facility.

Testing involved flying the F-15E with the weapon attached at the required speed to ensure successful performance.

– 96 ABW Public Affairs

Fighting F-16 Falcon

Parts kit extends service life of F-16 Fighting Falcon

By Will Daniel
Defense Supply Center
Richmond, Va.

Defense Supply Center Richmond officials are working on a billion-dollar, multi-year project that will extend the service life of the Air Force's F-16 Fighting Falcons.

The F-16 Structure Augmentation Roadmap, or "Falcon STAR," program uses parts kits to strengthen the aircraft's structure, officials said. The kits contain everything necessary to accomplish a maintenance task.

Officials said using the kits reduces maintenance turnaround time, which ultimately increases readiness. Center officials develop support strategies and initiate kit contracts. Without the modification, the F-16 will not be able to attain its projected 8,000-hour service life under current operational usage, said Pat Livingston, the center's F-16 weapon system support manager. Falcon STAR will allow the aircraft to remain in service through 2025, she said.

"(The Air Force's) aircraft structural integrity program continues to identify areas that will not meet the service life of 8,000 flight hours," Ms. Livingston said. "The (goal is) to modify the aircraft structure before the onset of widespread fatigue damage and aircraft grounding.

"This is a 'tip-to-tail' modification – 13 structural modifications including replacing bulkheads and wing-attachment fittings," she said.

Falcon STAR contains the list of structural parts necessary to address the areas identified by the aircraft structural integrity program, she said. There are more than 79,000 parts under 428 national stock numbers, all of which are managed by Defense Logistics Agency officials.

Parts for each kit are purchased by officials here and shipped to Defense Distribution Depot Red River, Texas, for assembly. The assembled kit is then shipped to Ogden Air Logistics Center at Hill Air Force Base, Utah, where the aircraft modifications are performed.

> "Using the kits reduces maintenance turnaround time, which ultimately increases readiness."

The modifications are scheduled to run through 2014, said Dave Graves, weapons system support branch chief here.

Officials here are working with the prime contractor on configuration of the kits. The contractor configured the initial 13 kits, and officials have configured 13 additional kits.

"We've been working configuration control issues," Mr. Graves said.

Somewhere between 40 and 100 iterations of the kit are expected, Ms. Livingston said.

The kit configuration is constantly changing because of the different aircraft configurations, said Greg Sprouse, chief of the center's kit section.

"So far it's going well," he said. "What we're doing is challenging because of the different configurations. It is a variable kit – it changes all the time."

More than 2,000 aircraft will be modified by 2014, Ms. Livingston said. Participants in the program include the Air Force and air forces in Belgium, Denmark, the Netherlands, Norway, Portugal, Israel, Greece, Singapore, Thailand and Bahrain.

On average, it takes 175 days to modify an aircraft with the Falcon STAR kit, officials said. The first modification was completed 14 days ahead of schedule, said Arnie Leighton of the aircraft division at Ogden Air Logistics Center.

Ten F-16s a month are expected to undergo the modification at Hill in 2005

(AF photo by Airman 1st Class Franklin J. Perkins)

C-130J receives upgraded software

The C-130J uses six-bladed props and has an improved engine-power to climb rate over older C-130 models. (AF photo)

By Capt. Catie Hague
95th ABW Public Affairs
Edwards AFB, Calif.

Last fall was a critical time for the C-130J's Block 5.4 upgrade, as Edwards Air Force Base testers determined the final adjustments needed to bring this software improvement to the operational fleet.

Currently, the C-130J has certain operational limitations, but the 5.4 software upgrade is designed to correct these shortcomings by enhancing the cargo-handling system, as well as advancing the communication, navigation and identification systems.

The 418th Flight Test Squadron's recent testing included mission computer regression, formation flying, air drop events, traffic collision avoidance system tests, computer-based approach testing and the most comprehensive noise and vibration tests ever conducted on the C-130, said Maj. Clifton Janney, 418th FLTS multi-engine test pilot.

"One of the key functions we've been evaluating with this 5.4 software is air drop upgrades for the back end of the aircraft," said Michael Berard, 418th FLTS C-130J program manager. "This software tells us how to load the cargo and how to get rid of it."

"Right now, the C-130J has limited air drop capability releases," he continued. "There is a 28,000-pound limit on the release of container delivery systems even though the max allowable weight is 42,000 pounds."

This weight limit is due to safety. The buffer stop assembly system put into place to secure the CDS pallets can only withstand so much pressure.

"However, with the low velocity air drop capability," Mr. Berard said, "we're allowed to drop the maximum weight and actually performed an LVAD (low velocity air drop) of 40,440 pounds."

LVAD pallets are bigger than CDS pallets and are held in place by anchors, not by the BSA.

"Our two-and-a-half-month testing of 5.4 identified these discrepancies, as well as other problems with the defensive systems and air land operations," said Mr. Berard.

The 5.4 software was returned to Lockheed Martin, the C-130J manufacturer, and is currently undergoing modifications to correct these deficiencies, he said. Software testing will continue beginning in February.

"When finished in May, we expect the air drop envelope to be cleared up to the max drop weight," Mr. Berard said.

"We also expect to see a better navigation solution and improved communications," he said.

The 5.4 upgrades are scheduled to be operational within the C-130J by the fall of 2005.

MALD
Miniature Air Launched Decoy

By 1st Lt. Carmen Hale
AAC Air-to-Missile Systems Wing
Eglin AFB, Fla.

A Miniature Air Launched Decoy flies through the air during its first captive flight test Dec. 7. (AF photo Staff Sgt. Scott Wilcox)

The Miniature Air Launched Decoy Team at Eglin Air Force Base, Fla., successfully executed the program's first captive flight test mission in December, followed by the first B-52 captive flight mission on Jan 19.

In the December flight, an F-16 Fighting Falcon from the 40th Flight Test Squadron carried three MALD Instrumented Measurement Vehicles up to 20,000 feet, at speeds up to 0.95 Mach and up to 5.5 Gs over the Eglin Test Range.

The January mission used an operational B-52 Stratofortress from the 49th Test and Evaluation Squadron at Barksdale Air Force Base, La.

"The ability to use an operational B-52 aircraft for developmental testing shows great synergy between different Air Force organizations, making this a true seamless verification test program," said Mr. Joel Ankersen, chief engineer for the MALD program.

Three IMVs were flown on each carriage aircraft in the MALD missions. "Using three IMVs resulted in a major savings when compared to flying with only one IMV at a time," said Mr. Ankersen.

Each IMV is highly instrumented and replicates the mass properties and the primary structure of the tactical MALD vehicle.

The missions are flown to collect captive carriage vibration, stress, temperature and acoustic data for the MALD vehicle environment. This data will be used to determine realistic MALD vehicle specification levels along with lower level assembly requirements.

The MALD is a small, low cost, air launched, expendable decoy. MALD is 113 inches long and weighs around 250 pounds. Once launched, the MALD deploys its wings, starts a small jet turbine engine, and flies a predetermined flight pattern. Its mission is to stimulate and saturate threat Integrated Air Defense Systems to increase the enemy's "fog of war" and increase aircraft survivability.

The MALD is being integrated on F-16 and B-52 aircraft. However, design space allows carriage on a wide range of tactical and strategic aircraft including the F/A-22, Joint Strike Fighter, B-1, B-2 and F-15.

The MALD Low Rate Initial Production decision is scheduled for 2008.

A C-130J flies over Edwards in December during a test of the upgraded software program, which will allow the cargo aircraft to carry a heavier payload than before. (Courtesy photo)

B-1B gets leaner, meaner

By 1st Lt. Brooke Davis
AFFTC Public Affairs
Edwards AFB, Calif.

Successful B-1B Lancer operations in Operations Iraqi Freedom and Enduring Freedom using 2,000-pound Joint Direct Attack Munitions showed a growing need to integrate a smaller version of the weapon into the bomber's weapons-carrying capability.

Testers from Edwards Air Force Base, Calif., answered the decreased firepower need by releasing, for the first time, an inert 500-pound GBU-38 JDAM during a flight at the China Lake Naval Warfare Center, Calif., bombing range while flying Mach .9 at 25,000 feet in December.

"The B-1 has been the backbone of bombing missions in OIF and OEF, dropping over 35 percent of all 2000-pound JDAMs," said Maj. Hans Miller, 419th Flight Test Squadron B-1B test pilot.

"With the increasing concern over collateral damage, the GBU-38 has grown in demand as the weapon of choice for strike forces. The SPO (Systems Program Office) was able to build testing the GBU-38 into the current software sustainment block test program."

The China Lake GBU-38 release was successful despite 50-knot winds, and the weapon impacted only three feet from the planned coordinates.

The impact of the weapon split the edge of a metal-container target on the ground, explained Major Miller.

The B-1B is loaded with software that allows aircrews to use "smart" weapons like the Joint Air-to-Surface Standoff Missile, Joint Standoff Weapon and JDAM.

The mixed load capability is unique to the B-1 — it is the only aircraft that can employ these weapons from the same bomb bay on the same bomb run, said Major Miller.

During the software sustainment block test program, testers perform flight tests to demonstrate new weapon employment capabilities and perform regression testing to verify previous weapon employment capabilities have not been affected by the new software.

It was a matter of efficiency to integrate certifying the B-1B to carry the GBU-38 while testing its other weapons, said Major Miller.

By combining the weapons testing with the software program, the GBU-38 capability is scheduled to begin operational testing by the beginning of March, he added.

The B-1B can carry multiple types of weapons, and testers are looking at the best employment tactics to take advantage of this capability.

Prior to the inert GBU-38 release Nov. 17, the B-1B captive carried a mixed load of JASSMs, JSOWs and Wind Corrected Munition Dispensers in various combinations in its three bays, said Mike Brooks, 419th FLTS test conductor and B-1 flight test engineer.

"The bays weren't completely loaded, and the aircraft was captive carrying the weapons, meaning that they weren't released," explained Mr. Brooks. "What we wanted to do was gather useful data and track how the weapons interacted with the software."

Testers also performed vibrations and acoustic testing in order to ensure vibrations in the bomb bays were within acceptable levels, he continued.

Because of the increased weapons capability, people working with the B-1B will have to figure out the best employment tactics and patterns to most effectively use the weapons in combat missions, said Major Miller.

An Edwards B-1B flies in a Dec. 8 sortie. Testers from Edwards successfully dropped for the first time an inert 500-pound GBU-38 Joint Direct Attack Munition at a bombing range at China Lake Naval Warfare Center. (AF photo by James Shryne)

Col. Joe Lanni, 412th Test Wing commander, Edwards AFB, Calif., (right), talks with Col. Frank Gorenc, 1st Fighter Wing commander, Langley, AFB, Va., after landing the F/A-22 at Langley. Colonel Lanni flew the Raptor from Edwards in its final test flight Jan. 7. The aircraft will be used as a training tool to keep 1st FW maintainers proficient in maintaining the Air Force's newest and most advanced aircraft. (AF photo by Staff Sgt. Samuel Roberts)

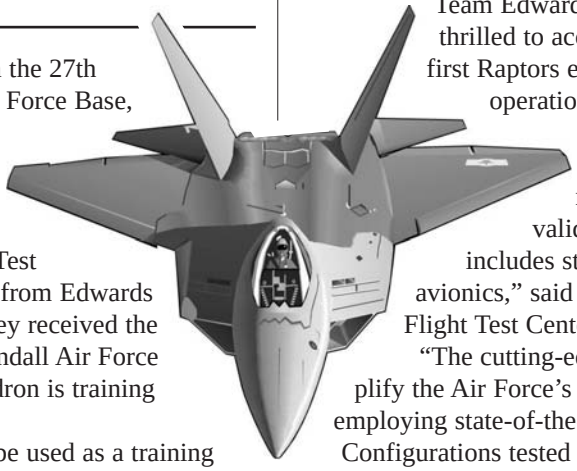
F/A-22 on track to go operational

By 1st Lt. Brooke Davis
AFFTC Public Affairs
Edwards AFB, Calif.

Air Combat Command pilots from the 27th Fighter Squadron at Langley Air Force Base, Va., began flying the Raptor this month, thanks in part to a maintenance trainer F/A-22 delivered in January.

The trainer, Langley's first Raptor, was delivered by Col. Joe Lanni, 412th Test Wing commander, who flew the aircraft from Edwards Air Force Base, Calif., on Jan. 7. Langley received the first operational aircraft Jan. 18 from Tyndall Air Force Base, Fla., where the 43rd Fighter Squadron is training future Raptor pilots.

The maintenance trainer F/A-22 will be used as a training tool to keep 1st FW maintainers proficient in maintaining the Air Force's newest and most advanced aircraft, according to 1st FW Public Affairs.



"It was a distinct honor to fly one of the test program's true workhorse aircraft across our country and officially sign the Raptor over to Langley," said Colonel Lanni.

"The 1st Fighter Wing commander couldn't thank Team Edwards enough and the maintainers were thrilled to accept the jet. Signing over one of the first Raptors ever built marked the beginning of its operational use and a new phase in this next-generation aircraft program," he said.

"Edwards has played a key developmental role in describing, verifying and validating the F/A-22's design, which includes stealth, agility, speed and integrated avionics," said Brig. Gen. Curtis Bedke, Air Force Flight Test Center commander.

"The cutting-edge capabilities of this aircraft exemplify the Air Force's concept of air dominance through employing state-of-the-art weapons and current technology."

Configurations tested on the F/A-22 at AFFTC include: AIM-120, AMRAAM, AIM-9 Sidewinder missile and Joint Direct Attack Munition. The F/A-22 is expected to achieve initial operating capability in December.

LAB DEVELOPS BETTER BODY ARMOR

By Sue Baker, APR
AFRL Public Affairs
Wright Patterson AFB, Ohio

Thanks to a bit of luck, timing and serendipity, 2nd Lt. T.J. Turner with the Air Force Research Laboratory Materials and Manufacturing Directorate has used a new material to make advanced, lightweight body armor for Department of Defense warfighters.

Teaming with a local industrial partner, Excera Materials Group of Columbus, Lieutenant Turner took only 18 months and $110,000 in laboratory funding to move from a research and development project to an actual Small Arms Protective Insert that can save lives.

Joining the AFRL directorate as a materials research processing engineer in 2002, Lieutenant Turner, who had just finished his doctorate at Cornell University in high-deformation materials, already had been thinking about a body armor system.

"In May 2003, Dr. Charles Browning, our director, challenged our unit's company grade officers to come up with workable 6.2 (basic and applied research and development) projects he would fund with directorate monies," Lieutenant Turner said. "He wanted us to look at rapid-response kinds of things, especially with regard to current, real-world threats."

Originally, the lieutenant's idea was to create a lightweight, composite (layered) panel with external angled tiles that would cause bullets to tumble and stop instead of piercing armor plating on tanks and aircraft. But along the way, the project took on new dimensions and was applied to body armor inserts for per-

Combat weather specialist helps forecast success

By Staff Sgt. Jennifer Lindsey
455th AEW Public Affairs
Forward deployed

Cloud reading may seem an ethereal art, but predicting the effects of alto cumulus clouds blowing over the southwest mountain range at Bagram Air Base, Afghanistan, is a pure science to aviators and ground troops traveling there.

Details on wind speed and direction, visibility, precipitation, temperature, and lightning detection forecasts are all more than "gee whiz" information, said Senior Airman Laci Wood, who is deployed from Eglin Air Force Base, Fla.

Pilots, both commercial and military, rely on weather updates for their flight planning and to help ensure a safe landing.

Combat weather specialists use a combination of technical equipment and old-fashioned visual cues to provide hourly forecasts to officials on base. In addition, the team distributes its data to military forecasting centers at Offutt Air

Senior Airman David Jensen, left, and Airman 1st Class Brian Corso, 386th Expeditionary Security Forces Squadron, observe the surrounding area. The low-cost, higher-performance and lighter ceramic Small Arms Protective Inserts, developed by AFRL, will fit into personal "flak" vests, like those worn by the soldiers pictured, to protect them from assault and other weapons fire. (AF photo by Senior Airman Nicole Spence)

sonal "flak" vests worn by troops deploying to war zones overseas.

"We wanted to focus on body armor first because it's a worst-case scenario – not only because you have to stop the bullet, you also have to stop the pressure-wave it generates enough not to kill the person," Lt. Turner said.

"Someone here put me in touch with Excera, which makes a unique, metallized ceramic material (boron carbide) by floating a ceramic in an aluminum bath that gives it hardness plus increased fracture toughness," he said. "Those are the two most important characteristics of good ballistics materials – hardness to break the bullet open and stop it, plus fracture toughness to permit multiple shots in the same area without harming the wearer."

Lieutenant Turner also said two other desirable qualities for ballistics materials are stiffness and durability in the field.

"If a soldier drops this material – called ONNEX – while unloading it from a truck or takes fire and drops down on his/her stomach, the curved vest plate, called a SAPI, isn't going to crack or break," he said.

"Backed by high-ballistics fibers called Dyneema and Rhino lining (for truck beds), the combination of materials will break assault-type bullets (AK-47, M-16) plus catch any stray bullet pieces before they hit the person or someone else," said Lieutenant Turner.

ONNEX also is estimated to have 10 times the fracture toughness of materials used previously and will not break as easily as pressed ceramic materials, Lieutenant Turner said.

According to Lieutenant Turner, other applications for the new material might include engines, flight controls, sensors and the Defensive Fighting Position (structural protection against sniper attacks).

Editor's Note:

Ms. Baker completed this article before she passed away in December. She was a long-time contributor to Air Force Materiel Command news and an accomplished author who, during her career as both an Air Force reservist and Department of Defense civilian, wrote hundreds of news articles highlighting the contributions of the men and women of AFMC.

Force Base, Neb., and Shaw Air Force Base, S.C.

"Altitude, temperature and the dew point affect aircraft altimeter settings (which pilots use) to assess how high from the ground they are in preparation for runway approach and touching down," said Lt. Col. John Cherrey, 81st Expeditionary Fighter Squadron commander and A-10 Thunderbolt II pilot.

Planners rely on accurate forecasts from the combat weather team to help ensure mission success, said Staff Sgt. Jim Moullet, who is deployed from Ft. Polk, La. They are currently monitoring weather forecasts to predict humanitarian crises and to prepare responses.

"We're gathering winter coats, heaters and food to provide (them to) Afghans living in the higher elevations," said Army Maj. John Bircher, a Combined Joint Task Force 76 operations planner.

All of which is pretty cool, Airman Wood said.

"Predicting what the weather is going to do next can be difficult and demanding work, but it's rewarding knowing that the work we do here is important," she said.

(Left, opposite page) Senior Airman Laci Wood, deployed from Eglin AFB, collects weather data from an observation. (AF photo by Staff Sgt. Jennifer Lindsey)

Senior Airman Hector Riojas (left), deployed from the Air Force Flight Test Center located at Edwards Air Force Base, Calif., helps move bags off a cargo pallet at the base passenger terminal Monday. Airman Adams is in transit to a forward-deployed location. (AF photo by Staff Sgt. Colette Bennett)

Museum turns 20

By Lanorris Askew
78th ABW Public Affairs
Robins AFB, Ga.

Twenty years ago with one HU-16 Albatross, 16,072 square feet of space and less money than it takes to fill up today's average gas tank, what would one day become the "Crown Jewel" of middle Georgia was born.

The local community celebrated the birthday of the Museum of Aviation Flight and Technology Center with special guest speakers and a cake-cutting ceremony.

Various aircraft throughout the facility were open for viewing.

Paul Hibbitts, museum director, thanked all who played a role in making the museum a success during the past two decades.

"What started out as one plane and $20 has turned into a great showcase of aviation history and the history of Robins Air Force Base," he said. "We've become the fourth largest aviation museum in the country, and we couldn't have done that without the help and support of the men and women of Robins and the Middle Georgia community."

Retired Maj. Gen. Cornelius Nugteren, former Warner-Robins Air Logistics Center commander, remembers getting a chuckle and a "good luck" in response to the idea of expanding the heritage program here by opening a museum.

He said he was told that there would be no federal money because only the Air Force museum at Wright-Patterson Air Force Base, Ohio, received those funds. That meant community support would be the museum's anchor.

"I don't think any community or any Air Force installation could've done what this community and our people have done," he said. "This is truly amazing."

He also commended commanders who have supported the museum since its birth.

Mr. Hibbitts echoed his sentiments.

"We've always had leadership who believed in the heritage program and continuing to tell the story of aviation history for Robins and the state of Georgia," he said. "Their getting it

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— Paul Hibbitts, Museum Director

Jonathan Brand, 3, sits in the cockpit of the F-15 with the help of Lt. Col. Kevin Coleman, 339th Flight Test Squadron. (AF photo)

The Museum of Aviation Flight and Technology Center opened in November 1984. It has grown to become the fourth largest aviation museum in the country. Located on 55 acres, it has 95 aircraft and more than 200,000 square feet of exhibits. The facilities are open from 9 a.m. to 5 p.m. seven days a week except Thanksgiving Day, Christmas Day and New Year's Day. Admission is free.

started was the key in giving us the support we needed to keep it going."

And it keeps going.

Educating students with such programs as Starbase Robins, Mission Quest and Middle Georgia youth and science center, the museum is teaching the young and old alike.

"We don't take a back seat to any museum in America when it comes to providing inspiration and direction to the students who pass through here," said Pat Bartness, president and chief operating officer of the museum foundation. "This is not a static institution; it's a living, breathing, evolving facility that plays a key role in the Middle Georgia community."

Visitors to the museum will be wowed by aviation marvels both past and present, but what may impress them just as much is the staff.

The facilities that make up the museum are manned by folks who love aviation and sharing its wonders.

"We have about 86 volunteers who spend anywhere from four to16 hours a week coming here to man the information desk, conduct guided tours, work in the gift shop and even help with restoration work," said Mr. Hibbitts. "All of these folks give of their time because they love this museum, and they love meeting and greeting folks and talking about their experiences. We couldn't do on a day-to-day basis what we do without our volunteers."

Myrel Harner is one of those volunteers. Each Thursday he gives tours of aircraft, some of which have special meaning to him, such as the B-29 Stratofortress. Mr. Harner was a flight engineer on the aircraft from 1948 to 1949.

A volunteer at the museum for 12 years, he said the job adds a little order to his life. "Here I have a schedule and I need that now since I'm retired," he said. "I enjoy being here. I like the old airplanes and the people I get to talk to. Every so often one (aircraft) comes in that I haven't seen in 40 or 50 years, and it's just wonderful."

While the past two decades have been very productive in terms of growth, the future of the museum looks bright as well. According to Mr. Bartness, they are finalizing plans for an expansion that will include the construction of a 60,000 square foot World War II building.

"We received approval this past summer from the Air Force and the Army to proceed and have selected a contractor," he said. "The plan is to break ground on the project just after the first of the year."

Soon after, the aircraft and exhibits will be moved out of Hangar One, which will be torn down to begin work on the site of the new aviation hall of fame.

According to Mr. Hibbitts, that will help move more planes out of the weather as well as add exhibits to increase visitation.

Twins celebrate a half century

By Lanorris Askew
78th ABW Public Affairs
Robins AFB, Ga.

Many things have changed at Robins Air Force Base in the past 50 years. There have been runway extensions, new buildings, new units and a string of commanders. But one thing has been constant: the presence of Billy and Bobby Edwards, who are logistics management specialists.

The 69-year-old identical twins joined federal service at Robins Dec. 29, 1954, shortly after graduating from high school, and they say they've never looked back.

"It has been a very interesting, challenging and rewarding career," said Bobby, the younger of the two by 15 minutes. "I've enjoyed it tremendously, and I wouldn't trade it for anything in the world."

Born and reared in Perry, Ga., the two moved to the city of Warner Robins in 1947. After graduating from Perry High School, they began their post-secondary education at Georgia Alabama Business College in Macon.

While attending the business school they saw a notice explaining how to apply for employment on the base.

"Everyone was filling out applications, and we did, too," said Billy. "We were notified to come and take the examination that was required to process us into government employment and the rest is history."

The brothers have seen a lot of changes at Robins since their arrival as supply clerks a half century ago.

"Our first job was to keep up with the materials in the bins in the warehouse," said Billy. The brothers kept their records in a way that's very different from the way the job is done now – they used a pad and pencil.

"It was all manual then," Billy said, "There were no computers or automated processes. Even adding machines were very rare."

While their milestone of 50 years is unique to their family, working at Robins is not. Their mother, father and brother also worked here.

"Our father was a hydraulics bearings specialist, our mother was a supply specialist, and our brother worked in engineering," said Billy.

Looking back on their time there, the brothers both have fond memories and no regrets.

"This career has given me opportunities to travel all over the world, opportunities that I wouldn't have otherwise had," said Bobby. "People don't have those kinds of opportunities every day."

"I don't have any plans of giving it up," said Bobby. "When people ask what I plan to do now that I am getting my 50-year pin, I say 'I may be here for 20 more years, do you think I could make it?' They ask, are you sick in the head, and I say 'no'. Everybody has got to be somewhere, and if I like what I'm doing, then that's what counts."

Eglin officer rides to cure cancer

By 2nd Lt. Alyson Smith
96th ABW Public Affairs
Eglin AFB, Fla.

One Eglin Air Force Base lieutenant went a long way in his efforts to support the Lance Armstrong Foundation in 2004.

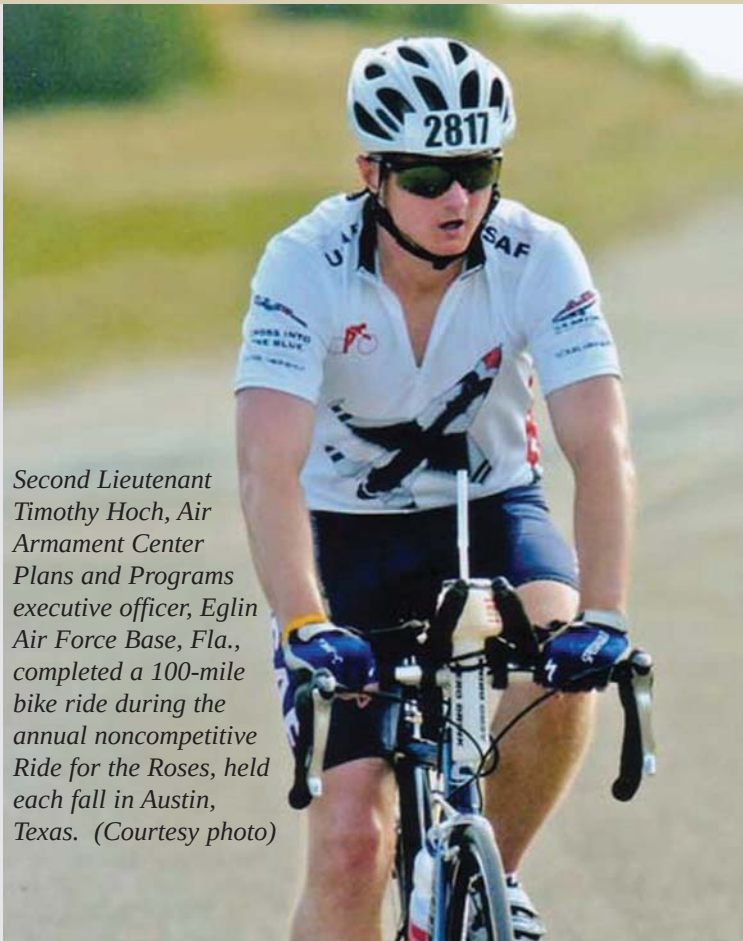
After three months of fundraising, 2nd Lt. Timothy Hoch, Air Armament Center Plans and Programs executive officer, completed a 100-mile bike ride at the end of the fundraising year.

The annual Ride for the Roses, held each fall in Austin, Texas, is a noncompetitive bike ride celebration for those who raised money in support of the Peloton Project, the fundraising arm of the Lance Armstrong Foundation.

"It was challenging, with a couple of really evil hills at the end, but the ride isn't the most important part. The fundraising should be the focus," Lieutenant Hoch said.

Lieutenant Hoch became involved with LAF after a cycling partner of his survived skin cancer. Although he was participating in the ride for the first time, he raised more than $1,000. More than half of that was due to funds received from people at Eglin, he said.

Lieutenant Hoch said he rode with many cancer survivors in Austin, one of whom was a cancer patient who completed the ride in the middle of chemotherapy.



Second Lieutenant Timothy Hoch, Air Armament Center Plans and Programs executive officer, Eglin Air Force Base, Fla., completed a 100-mile bike ride during the annual noncompetitive Ride for the Roses, held each fall in Austin, Texas. (Courtesy photo)

Bobby,left, and Billy Edwards receive pins for 50 years of service at Robins Air Force AFB, Ga. The 69-year-old identical twins joined federal service at Robins Dec. 29, 1954. (AF photo by Sue Sapp)

Another was a 16-year-old who completed the ride after overcoming a brain tumor.

"It was just absolutely amazing to be riding with these people who benefited from this cause," he said.

According to the Lance Armstrong Foundation's Web site, www.laf.org, there are almost 10 million people living with cancer today. One of the more than 200 forms of cancer will affect one in three Americans at some time in their lives. Cancer survivor and repeat Tour de France winner Lance Armstrong started the Lance Armstrong Foundation in 1997. Its aim is to educate cancer patients about the disease and treatment options, serve as an advocate for governmental support for patients and their families, and support research.

The foundation also plans, develops and funds programs to support survivors after treatment. Money raised through Peloton Project totaled $5.5 million in 2004.

"The Lance Armstrong Foundation believes that in your battle with cancer, knowledge is power and attitude is everything. Live strong," the Web site proclaims.

Lieutenant Hoch will be participating in the ride again in October, and will begin his fundraising letter-writing campaign in March. His goal this year is to raise $5,000.

Lieutenant Hoch began cycling in 1998 while stationed in Japan. He says it is a great way for him to stay in shape and clear his head. For information on this event or raising funds, e-mail him at timothy.hoch@eglin.af.mil.

Dog-day afternoons

By Jeanne Grimes
72nd ABW Public Affairs
Tinker AFB, Okla.

For one newly retired Air Force veteran, the first day of civilian life was pretty predictable — a nice relaxing bath, a good meal, kicking back on the sofa to catch a little TV and turning in for the night on a cushy bed.

In the time it takes to scarf a couple of treats, military working dog Rano W083 checked out of his Spartan quarters in the 72nd Security Forces Squadron kennel and started living the life of Riley.

His recent send-off at the Tinker Club was worthy of his years of service.

After receiving a meritorious service certificate and a tennis ball tug toy, Rano humbly accepted homage from some former kennel-mates who passed in review with their handlers.

The certificate for meritorious service noted Rano distinguished himself as a patrol and narcotics detector dog at Tinker Air Force Base from July 13, 1994, to Dec. 1, 2004.

"During this period, Rano deployed to El Paso, Texas, in support of United States Customs, where he single-pawedly searched hundreds of vehicles entering the United States," the citation reads. "As the first line of defense against drug trafficking, he detected 810 pounds of illegal narcotics in just three months. He also led the way in keeping Tinker Air Force Base a drug-free environment, with 55 narcotics finds on the installation."

His leash passed from his handler, Staff Sgt. Joseph Kissinger, to 72nd SFS Commander Maj. Max Dubroff and, finally, to Senior Airman Jillian Canfield, a patrolman in the squadron, who adopted Rano.

"He's done a great job," Sergeant Kissinger said of his four-footed partner. "He's great!"

Military working dog Rano W083 is living the life of Riley with Senior Airman Jillian Canfield since his retirement from the Air Force. The Airman adopted the former patrol and narcotics detector dog upon his retirement. (AF photo by Dave Faytinger)